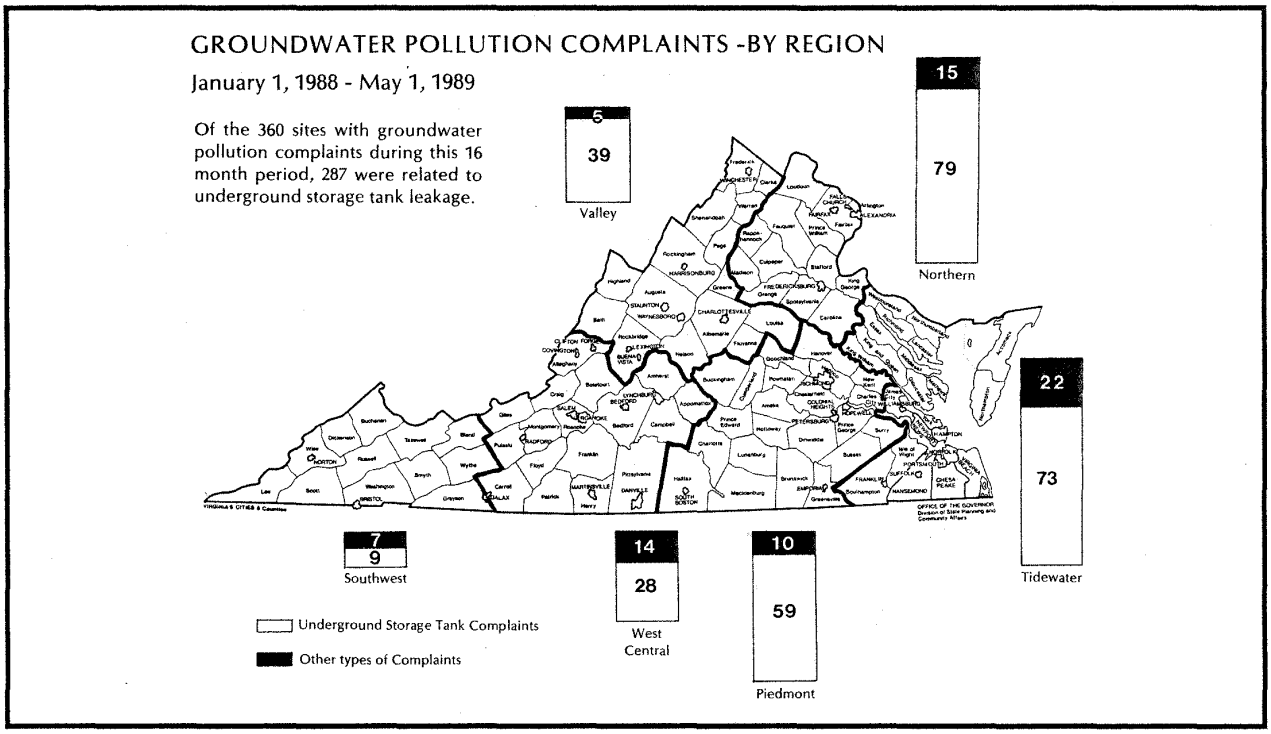
1989 Groundwater Protection in Virginia

Second Annual Report of the Groundwater Protection Steering Committee



Underground storage tanks continue to be the most frequent source of citizen concern.

GROUNDWATER PROTECTION ACHIEVEMENTS

THE GROUNDWATER PROTECTION STEERING COMMITTEE

The Groundwater Protection Steering Committee was formed in late 1985 and is composed of representatives of the state agencies whose programs address activities that could have potential groundwater quality impacts. Included are:

Chesapeake Bay Local Assistance Dept.
Cooperative Extension Service
Council on the Environment
Dept. of Agriculture & Consumer Services
Dept. of Conservation & Historic Resources
Dept. of Health
Dept. of Housing & Community Development
Dept. of Mines, Minerals & Energy
Dept. of Waste Management
Water Control Board (Chair)

Virginia's effort is supported by a grant from the U.S. Environmental Protection Agency. States have the primary responsibility for developing their own individualized plans for groundwater protection with assistance and funding grants from the federal government.

The Steering Committee was charged with the responsibility of assessing current problems, identifying program needs, and setting priorities for new programs for groundwater protection. In May 1987 *A Groundwater Protection Strategy for Virginia* was published setting the overall course of groundwater protection for the Commonwealth. The Strategy called for an annual progress report to the Governor, the legislature and the citizens of the Commonwealth . This is the second such annual report.

Copies of the 1987 Strategy, the 1988 annual report, and additional copies of this 1989 annual report may be obtained from the Virginia Water Control Board, P.O. Box 11143, 2111 North Hamilton St., Richmond, Virginia 23230 or 804/367-6351.

NEW LEGISLATION & REGULATIONS

Virginia Pesticide Control Act

The Virginia General Assembly adopted a new Virginia Pesticide Control Act during the 1989 session which sets a new agenda for pesticide management in the state. The legislation was based on recommendations presented by a subcommittee of the Council on the Environment working with the Virginia Department of Agriculture and Consumer Services in a special report to the Governor entitled "Pesticide Management in Virginia."

In September, Governor Baliles had asked the Council subcommittee to accelerate their review and report their findings and recommendations to him prior to the beginning of the 1989 session of the General Assembly.

The new legislation contains provisions that address the twelve major areas of recommendation made in the Council's report. Foremost among these is the establishment of an eleven

member "Pesticide Control Board" within the Virginia Department of Agriculture and Consumer Services. The Board will have broad regulatory powers in all areas of the new pesticide program. This could include canceling or denying registration for a pesticide product that contaminates groundwater above certain levels or that results in the death or impairment of wildlife species.

The legislation also establishes a number of program components designed to protect public health and natural resources, including the following:

- Creation of consumer-oriented public information and education program to help encourage the use of alternative, less toxic pest controls and to prevent the misuse of pesticides.

- An annual business license requirement for commercial firms who sell, distribute, store, apply or recommend pesticides. Record keeping and reporting requirements will enable the Department to closely monitor the use, purchase, distribution, and storage of pesticides.

- Public notification of pesticide use near structures.

VA Pesticide Control Act (cont.)

- A minimum $200,000 bond or liability insurance policy before a business license will be issued.

- A two-tiered system of certification for commercial applicators.

- Previously, commercial applicators were only licensed if they were applying restricted-use pesticides. The new law requires licensing when applying general-use pesticides as well.

- The new Act includes penalties which will allow the state a broader range of enforcement options. Civil penalties will range from a minimum of $1,000 to a maximum of $100,000. Any person who knowingly violates the provisions of the Act or regulations may be guilty of a Class I misdemeanor, and subject to an additional fine of up to $500,000.

The "Virginia Pesticide Control Act" is effective July 1, 1989. This significantly advances the objectives set out in the *Groundwater Protection Strategy.*

For more information contact the Council on the Environment, 903 9th St. Office Building, Richmond, VA 23219 or 804/786-4500 or the Department of Agriculture and Consumers Service, 1100 Bank Street, Richmond, VA 23219 or 804/786-3798.

Solid Waste Management Regulations

Landfill leachates were identified by the *Groundwater Protection Strategy* as one of the more important groundwater pollution threats in Virginia. Precipitation and surface water passing through the landfill's olids, semi-solids, liquids and containerized gases can leach out a variety of contaminants and carry them into the groundwater.

In an effort to address this problem the Virginia Waste Management Board adopted new Solid Waste Management Regulations on December 21, 1988. The regulations require that all new waste management facilities, principally landfills, now meet stringent standards for design, construction and operation. Existing waste management facilities have until 1992 to come into compliance. The regulations require groundwater monitoring, double clay or synthetic liners, a leachate detection zone between the liners, and a leachate collection system.

Recognizing that costs will increase the Virginia General Assembly approved an administration initiative which expanded the bond authority of the Virginia Resources Authority by 100 million dollars and adds waste management activities to the list of eligible items for financing. The funds will assist local governments to meet the Commonwealth's new solid waste regulatory requirements.

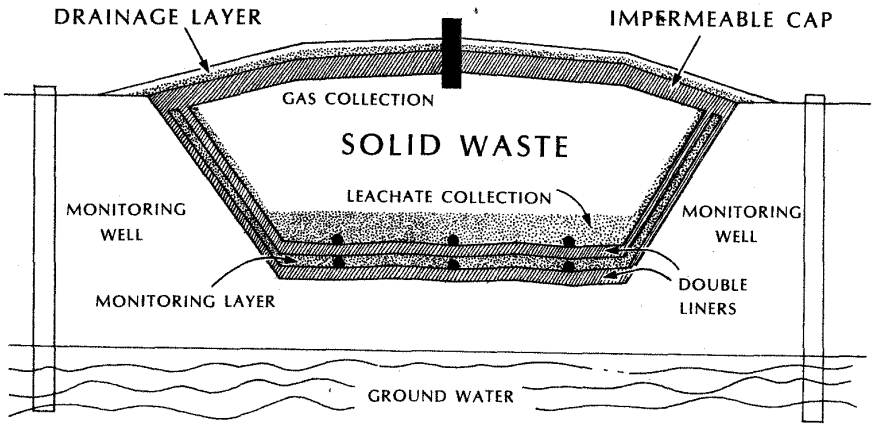
This combined regulatory program and financial support will provide local governments with a comprehensive approach to better control potential groundwater and other environmental impacts from waste management facilities.

For further information about the new permitting requirements contact Dr. Vladimir Gulevich, Department of Waste Management, 101 N. 14th St., Richmond, VA 23219 or 804/225-2667. For further information on the Virginia Resources Authority contact Hap Gardner, Department of Waste Management, 101 N. 14th St., Richmond, VA 23219 or 804/644-3100.

Underground Storage Tank Regulations

Reported groundwater contamination incidents in Virginia have increased each year and a majority of these incidents involve contamination from underground storage tanks (UST). The EPA estimates that as many as 12-35% of existing UST's eventually leak.

SANITARY LANDFILL



Underground Storage Tank Regulations (cont.)

This previously "out of sight, out of mind" problem was given a high priority as a serious threat to the state's groundwater resources in the *1987 Groundwater Protection Strategy for Virginia.*

In 1987, the General Assembly created Articles 9 and 10 of the State Water Control Law authorizing the Water Control Board to administer the Underground Storage Tank Program. In the fall of 1988, U.S. Environmental Protection Agency (EPA) published regulations for technical standards, corrective action requirements and financial responsibility of USTs. State regulations the federal regulation with modifications are currently being proposed.

UST Technical Standards & Corrective Action Requirements

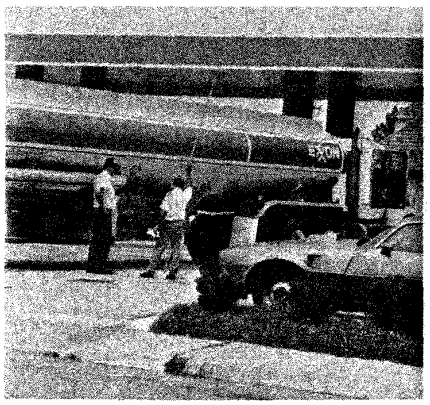
The federal regulation addressing technical standards for installation, upgrade, closure and corrective action requirements became effective nationwide on December 22, 1988. The Water Control Board reviewed the federal regulation and found it suitable for state use with some minor modifications. Proposed State requirements include: permitting of installations, upgrades, repairs and closure of USTs by local building officials; regulation of tanks having a capacity of more than 5,000 gallons used for storing heating oil; and notification requirements for owners of property having USTs taken out of service (yet remaining in the ground) before January 1, 1974.

Newly installed tanks are required to meet new tank standards at the time of installation. Existing USTs will be required to upgrade to the new tank standards over a ten year period ending in 1998.

UST Financial Responsibility

The federal financial responsibility regulations became effective January 24, 1989. They require owners or operators of USTs containing petroleum to demonstrate evidence of financial responsibility. Financial responsibility is required to cover corrective action and third party compensation for accidental releases. There is a two year phase in based on the category of business. Most gas stations and small businesses will have until October 1990 to meet the federal requirements.

Article 10 of the State Water Control Law addresses State financial responsibility requirements and sets up a Virginia clean up fund to be used in conjunction with the federal financial responsibility requirements. During the 1989 session, the General Assembly amended Article 10 to allow the Water Control Board to establish financial responsibility requirements of not less than $50,000 for third party compensation.



Public meetings have been held to receive comments on the proposed regulations. Final rules are expected to be adopted by the end of 1989.

For information on the Virginia Underground Storage Tank regulations contact, Russell P. Elliston; for leak cleanup requirements contact David P. Chance at the Virginia Water Control Board, P. O. Box 11143, 2111 North Hamilton St., Richmond, VA 23230 or 804/367-6351.

Private Well Construction Regulations

Wells are a direct connection between groundwater and the surface environment and provide a ready conduit

"Wells provide a conduit for contamination unless care is taken . . ."

for contamination unless care is taken in construction, maintenance, or abandonment of wells.

In 1983, the Health Department conducted a survey of households with shallow, bored well water supplies. The survey revealed that over seventy percent of the 200 household well systems sampled in the south-central Piedmont had serious water quality problems.

Currently, the Health Department only regulates private wells drilled in conjunction with an on-site sewage disposal system and well abandonment comes under State Water Control Board criteria. The Private Well Regulations will broaden the scope of wells governed by the Health Department by establishing location, construction, and sampling requirements for all non-public wells as well as providing standards for the abandonment of wells. Both drinking water and non-drinking water wells will be covered. Observation and monitoring wells are exempt from the location and construction requirements.

The Attorney General's office has reviewed the proposed Private Well Regulations. The Department anticipates publishing the regulations with the Registrar's office and holding public hearings during the summer. Final

Private Wells (cont)

adoption is anticipated by the late fall of 1989.

For further information contact the Division of Sanitarian Services, Department of Health, 9109 Governor Street, Richmond, VA 23219 or 804/786-8559.

Chesapeake Bay Preservation Regulations

In 1988 the General Assembly passed the Chesapeake Bay Preservation Act which set up a state-local land use program for Tidewater Virginia to protect water quality in the Chesapeake Bay.

The Act established the Chesapeake Bay Local Assistance Board and a new Department of the same name. The Board was charged with adopting regulations that establish criteria for use by local governments in (i) determining the ecological and geographic extent of lands to be designated Chesapeake Bay Preservation Areas, and (ii) in granting, denying, or modifying requests to rezone, subdivide, or to use and develop land in these areas. The Board is also to provide local governments with financial and technical assistance, policy guidance, and oversight when requested or otherwise required to carry out the provisions of the Act.

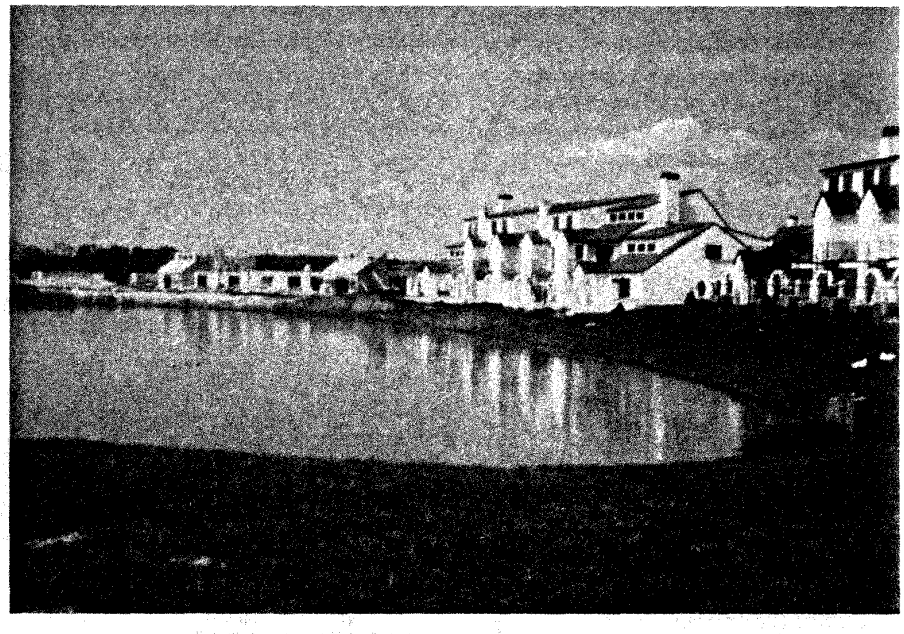
On June 28, 1989 the Board adopted final regulations as required by the Act. The next step will be for local governments to come into conformance with the new regulations within one year.

One provision in the proposed regulations addressed on-site wastewater treatment facilities, principally septic systems. The proposed regulations, which would have applied only within Chesapeake Bay Preservation Areas, would have been more stringent than those imposed now by the Virginia Department of Health. Proposed was an increase in vertical separation between the bottom of a septic drainfield trench and the groundwater table, from a current minimum of two inches to a proposed minimum of 18 inches. There would also have been a requirement for periodic inspection and pump out as well as a reserve drain field. This would prevent problems now experienced with saturation of drainfields by groundwater, allowing nutrients, bacteria and viruses to seep into the groundwater and, potentially, into nearby streams and ultimately in the Bay.

The Virginia Department of Health and the Groundwater Protection Steering Committee supported the proposal. Septic systems were identified in the *Groundwater Protection Strategy* as one of the more important potential groundwater pollution threats. These proposed septic tank provisions drew more public comment and telephone calls than any other part of the proposed regulations. The final draft of the proposal was modified to delete the 18 inch rquirement. In adopting the final regulation on June 28, the Board elected by a 6-3 vote to refer the whole septic issue to the Department of Health rather than to adopt the current proposal. The door was left open that the Board might reconsider this issue in the future.

As a part of its technical and financial assistance role, the Chesapeake Bay Local Assistance Department staff, in discussion with the Water Control Board staff, are reviewing the potential for some of the Department's local assistance funds to be used in developing DRASTIC maps for the localities in Tidewater Virginia (as defined in the Act). Such mapping would provide a valuable tool for local land use planning and efforts to prevent groundwater pollution.

For more information, contact the Chesapeake Bay Local Assistance Department, 701 Eighth Street Office Building, Richmond, VA 23219 or 804/225-3440.



NEW PROGRAMS

Waste Minimization Program

The Department of Waste Management has instituted a new Waste Minimization Program designed to assist industry and local governments in finding ways to reduce the volume and the toxicity of the wastes which are generated. The Program has two elements, one for solid waste and one for hazardous waste. The initial focus is on hazardous waste because of a federal requirement that all states assure capacity to manage all hazardous waste generated for the next twenty years. Within the hazardous waste program there are technical evaluation and management services programs. The technical program is designed to focus on operational adjustments to chemical processes to reduce the volume or toxicity of the waste. Management services focus on the potential need for industry's top management to promote reassessment of the company's philosophy of production. This may include changing product design to make products more amenable to recycling or reuse.

For more information contact Madeline Grulich, Department of Waste Management, 101 N. 14th Strreet, Monroe Building, Richmond, VA 23219 or 804/225-2667.

Solid Waste Recycling

The Solid Waste Management Program has added a recycling coordinator. A new recycling program is under development and will be implemented in conjunction with the new target established by the Virginia General Assembly: 25% of municipal solid waste

to be recycled by the year 1995. The recycling coordinator will be preparing model plans to assist local governments, planning district commissions and waste management authorities in implementing the new requirements.

The Virginia General Assembly also approved recommendations of the Joint Subcommittee studying the Alternative for Improving Waste Volume Reduction and Recycling Efforts. The two key recommendations concern the implementation of a Tire Recovery Fee and a Metals Recycling "Fluff" study. The tire recovery fund program will place a fee of fifty cents on the purchase of new tires. The funds will be used to assist local governments in cleaning up illegal tire piles and encouraging private enterprise to find alternative uses for existing tires and all used tires generated in the future.

The "fluff" study is also designed to address ground and surface water contamination issues. Processing of scrap metals leaves residuals which contain paint chips, plastics and foam materials which cannot be recycled. Often this fluff waste contains high concentrations of lead and cannot be placed in a municipal landfill. Stringent regulations can adversely affect recycling efforts because the cost of processing becomes too high. The study will look at alternative mechanisms for addressing this problem while insuring the protection of the environment.

For additional information contact Michael Murphy, Department of Waste Management, 101 North 14th Street, Richmond, VA 23219 or 804/225-2667.

Council on the Environment Assistance Program

The Council on the Environment's Local Assistance Program was established in March of 1988 to provide technical assistance on environmental issues and environmental planning to local governments through the Commonwealth. It is the intent of the program to promote better decisions by local governments in planning for and managing community growth. One important service is the assessment of potential impacts from private development activities. Impacts upon groundwater quality and quantity are frequently key issues of these reviews. To date, the program has assisted over 20 local jurisdictions on more than 40 different projects.

To get a better measure of local governments assistance needs a questionnaire has been developed which will solicit information from local government officials about their particular groundwater problems and concerns, the tools now used to manage the resource, and their perceptions of how management strategies could be improved. The results from this survey will be used to develop a catalog of groundwater management tools, including innovative approaches employed within and outside the Commonwealth.

For further information contact the Council on the Environment, 903 9th Street Office Building, Richmond, VA 23219 or 804/786-4500.

Non-Point Source Pollution Management

Pollution potential from point sources is often obvious. Less obvious, but equally serious, is pollution potential from non-point sources. Runoff, erosion, and sedimentation caused by construction, farming and urban activities often may contain pesticides, fertilizers, animal wastes, nutrients, and chemicals. These materials can degrade the water quality that many depend on for water supplies.

The Department of Conservation and Historic Resources, Division of Soil and Water Conservation is the lead agency for the development of the State Non-Point Source Pollution Management Program. That plan has been submitted to the Environmental Protection Agency (EPA) for their final review and approval during the summer of 1989. With approval comes eligibility to apply for non-point source implementation grants to support activity that will address potential groundwater impacts. Other activities underway during 1988-89 include:

Continued monitoring of two agricultural watersheds (one cropland, one livestock) to determine the effectiveness of best management practices (BMPs) in protecting ground and surface water resources. Research on these two sites is projected to continue until 1995.

Eight new personnel were hired in January 1989 as nutrient management specialists. They are assigned to work in the Chesapeake Bay drainage basin. Eleven personnel were also added to work within the urban erosion and sediment control program statewide to better ensure the usage of urban best management practices.

The 1989 General Assembly passed legislation requiring the Division to promulgate regulations for stormwater management. Six additional positions were also authorized by the legislature to work on stormwater runoff control.

The Division and the Virginia Cooperative Extension Service developed two videotapes on proper nutrient management.

For more information, contact the Division of Soil and Water Conservation, Department of Conservation and Historic Resources, 203 Governor Street, Richmond, VA 23219 or 804/786-2064.

RESEARCH AND DEVELOPMENT

DRASTIC Demonstration Project

The *Groundwater Protection Strategy for Virginia* recommended that local governments be encouraged and assisted in the development of groundwater vulnerability maps that can be applied to land use and planning decisions. They also need information for their area to make well-informed decisions. DRASTIC mapping was selected as a demonstration project in six Virginia counties to evaluate its effectiveness to supply this needed information.

DRASTIC is an acronym that describes the factors used in a mapping system designed to evaluate the groundwater pollution potential of an area. The system uses a set of factors relating to soil characteristics, rainfall, geology and topography to establish the potential for contamination of groundwater. A numerical DRASTIC index is calculated from these factors

Each area is classified (i. e. 10C) and assigned a DRASTIC Index value (i.e. 168). The index, ranging from a low of 60 to a high of 182 in Prince William County, indicates relative groundwater pollution potential.

DRASTIC Demonstration Project (cont)

and can be mapped to show the relative differences in pollution potential for groundwater in the area.

With the aid of EPA grant funds and with the National Water Well Association (NWWA) as a consultant, the VirginiaWater Control Board has completed the first phase of a DRASTIC demonstration project in the six Virginia counties. These are: Botetourt, Carroll, Rockingham, Prince William, Henrico, and Middlesex. NWWA also prepared a final report outlining the DRASTIC methodology, a description of the Virginia project and copies of the six maps.

The second phase of this project will be to present a workshop to interested localities and to evaluate the usefulness of the DRASTIC maps. VWCB plans to prepare a report evaluating the use of DRASTIC by the counties participating in the project by July 1990. Until the report is completed, full endorsement of the system for making land use decisions cannot be given by the Water Control Board.

For more information contact Terry Wagner, Virginia Water Control Board, P. O. Box 11143, 2111 North Hamilton Street, Richmond, VA 23230 or 804/367-6347.

Groundwater Withdrawal Model: York-James Peninsula

The Groundwater Act of 1973 authorized the Virginia Water Control Board to regulate non-agricultural groundwater withdrawal within designated groundwater management areas. The Board may initiate a groundwater management area proceeding when groundwater levels in the area are declining, there is substantial well interference, there is danger of overdrawing the aquifers, or there are pollution problems. To date, two areas have been declared groundwater management areas: Southeastern Virginia and the Eastern Shore of Virginia.

Recently the U.S. Geological Survey (USGS) released reports which describe critical conditions in the southeastern area of Virginia and on the York-James Peninsula. The USGS, in cooperation with the VWCB, developed a three dimensional model to simulate and predict the impact of major withdrawals on groundwater. The model was the basis for the reports.

The model indicates potential groundwater level declines and well interference across Southeastern Virginia and in the York-James Peninsula. In addition, analysis of groundwater flow direction indicates potential for saltwater instrusion due to these withdrawals.

The VWCB is currently reviewing comments received on the report at a public meeting and a staff recommendation of appropriate action is expected this summer.

For further information contact Fred Cuningham, Virginia Water Control Board, P. O. Box 11143, 2111 North Hamilton Street, Richmond, VA 23230 or 804/367-0411.

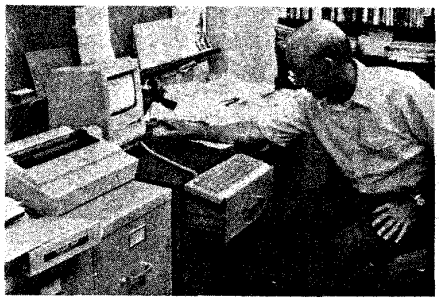
Mining & Mineral Resource Data Base

The Department of Mines, Minerals and Energy (DMME) has established a Technical Data Management System (TDMS) for mining and mineral resource information. This system will improve the usefulness of the Department's information on environmental resources related to mining and minerals development.

The DMME is concentrating first on creating a geohydrologic data base for the Southwest Virginia coalfield ara. The geologic and hydrologic information on the computer includes data from (1) geologic mapping by the Division of Mineral Resource, (2) the Division of Mined Land Reclamation's coal mining permits and water monitoring programs, (3) core logs provided by the coal companies, and (4) a regional groundwater resource study done in cooperation with the U.S. Geological Survey. The geologic data includes stratigraphic sections, strata analyses, and published geologic quadrangle maps. The water data includes the results of surface water and groundwater monitoring analyses.

The information management system utilizes a super minicomputer and hardware that can copy map information into the computer and create new maps and reports.

For more information, contact the Division of Mined Land Reclaimation, Department of Mines, Minerals, and Energy, P. O. Box Drawer U, Big Stone Gap, VA 24219 or 703/523-2925.



Inter-Agency Data Management System

The *Groundwater Protection Strategy for Virginia* recommended the establishment of a coordinated interagency data collection, management, and use system that will provide reliable information concerning the Commonwealth's groundwater related data. The Steering Committee created a Groundwater Data Management Task Force of technical staff to supervise this effort. In addition, a consultant was hired to assist the State in designing a system.

The report prepared by the consultant describes data collection and management practices at the agencies represented on the task force and makes recommendations concerning the conceptual design of an interagency data management system. The task force reviewed the report and developed a list of recommended actions for each of the agencies to begin implementation of the data management system. Next steps include working out the implementation plans for each of the recommendations and on-going coordinator.

For more information contact Terry Wagner, VWCB, P.O. Box 11143, Richmond, VA 23230 or 804/367-6387.

POLICY REVIEW

Antidegradation Policy & Numeric Standards

Clarification of the current antidegradation policy was recommended in the *Groundwater Protection Strategy for Virginia.* That report concluded that review and revision were necessary in order to establish a strong "anticipate and prevent" strategy and to promote broader understanding of the standard by the public, regulated community and the state agencies themselves.

The Institute for Environmental Negotiation at the University of Virginia coordinated six meetings in the spring of 1988, where 36 individuals from industry, government and environmental groups met to build a consensus about groundwater antidegradation. The Virginia Water Control Board staff provided technical support and observed the Advisory Group's meetings.

In the summer of 1988, the Advisory Group submitted a proposal to the Water Control Board based on clarifying the definition of "high quality waters" as those which are cleaner than the adopted standards at the time the standards become effective. The Group also proposed that a "facility boundary" be established for each activity with a potential to affect groundwater. The "facility boundary" would be kept as small as possible within the owner's property, and permits would be used to establish limits for groundwater pollution and a monitoring regime at the discretion of the agency. Where waters are not high quality, each application would be addressed on a case by case basis.

The Advisory Group believes that an important advantage that this proposal has over the current standard is that it establishes a consistent framework that lets all interested individuals know what to expect and removes possible confusion that antidegradation means absolutely no change from background conditions.

This past fall, the Virginia Water Control Board held a public meeting to receive comments from interested persons on:

- the Advisory Group's proposal
- existing groundwater standards
- the need for new numeric groundwater standards.

The Agency has reviewed these comments and plans to propose new groundwater standards.

For further information contact Fred K. Cunningham, Virginia Water Control Board, P. O. Box 11143, 2111 North Hamilton Street, Richmond, VA 23230 or 804/367-6387.

Sewage Handling & Disposal Regulation Review

The Department of Health has established an Advisory Committee to review the Sewage Handling and Disposal Regulations which include septic tanks. A subcommittee is to review the degree to which current regulations protect groundwater. This quetion was raised most recently by the Chesapeake Bay Local Assistance Board regarding septic tanks in the Tidewater area. Meetings began in April 1989.

For further information contact Robert W. Hicks, Division of Sanitarian Services, Department of Health, Madison Building, 109 Governor Street, Richmond, VA 23219 or 804/786-3559.

Comprehensive Planning As a Factor in Groundwater Protection

Many parts of Virginia would be uninhabitable without a reliable source of potable groundwater. Groundwater is the primary source of drinking water for a third of the state's citizens - eighty percent of them use groundwater to satisfy a part of their everyday needs.

Local governments are authorized to make groundwater protection a primary consideration in their planning and land use decisions. They can incorporate a groundwater protection element into their Comprehensive Plans. The specific authority to plan for groundwater protection (15.1-446.1. 5.) was added to the Code by the legislature in 1988.

The Comprehensive Plan is a logical place to address the task of groundwater protection since it establishes directions and sets objectives for guiding future growth and development. The plan will increasingly be used to address this critical problem of prevention and protection of a necessary resource, groundwater.

For questions about the Comprehensive Plan and the state code, contact the Department of Housing and Community Development, 205 North 4th Street, Richmond, Virginia 23219 or 804/786-7891.

"Localities, to date, have been the level of government least involved in protecting groundwater"

A Groundwater Protection Strategy for Virginia

EDUCATION AND TRAINING

Virginia Cooperative Extension Service Education & Training

Groundwater protection has been incorporated into the on-going educational program of the Virginia Cooperative Extension Service. Program goals focused on nutrients, leachates, pesticides, toxics and overall water quality now include groundwater as a key element.

While much of the past VCES groundwater educational effort - such as the regional groundwater protection seminar held in September 1988 for local officials, land managers and interested citizens from the Richmond area - was designed for a general audience, recent programs have been designed for particular audiences. These targeted programs include:

- nutrient management in agricultural, home garden and lawn use
- integrated pest management
- pesticides (all applications)
- on-site septic systems
- materials for planning officials and local administrators
- youth education on groundwater

Some of these targeted programs are supported by and involve other state agency programs. The nutrient management educational program for both farmers and urban areas is coordinated with the Division of Soil and Water Conservation's nonpoint source program. The pesticide education program is coordinated with the Department of Agriculture and Consumer Services pesticide program.

A survey of home owners on lawn and garden chemicals, (VPI & SU Staff Paper SP-88-34) and an Extension publication, "Groundwater Quality and the Use of Lawn and Garden Chemicals by Home Owners" (VCES Publication 426-059, 1988), were produced and distributed throughout Virginia. Papers from these two projects were also presented at the March 1989 Conference on "Groundwater Issues and Solutions in the Potomac River Basin/Chesapeake Bay Region." Those papers were "Lawn and Garden Chemicals and the Potential for Groundwater Contamination" and "Groundwater Protection and the Role of Education - An Appraisal."

For further information contact Waldon Kerns, Virginia Cooperative Extension Service, 312A Hutcheson Hall, VPS/SU, Blacksburg, VA 24061 or 703/231-5995.

Birdwood Conference

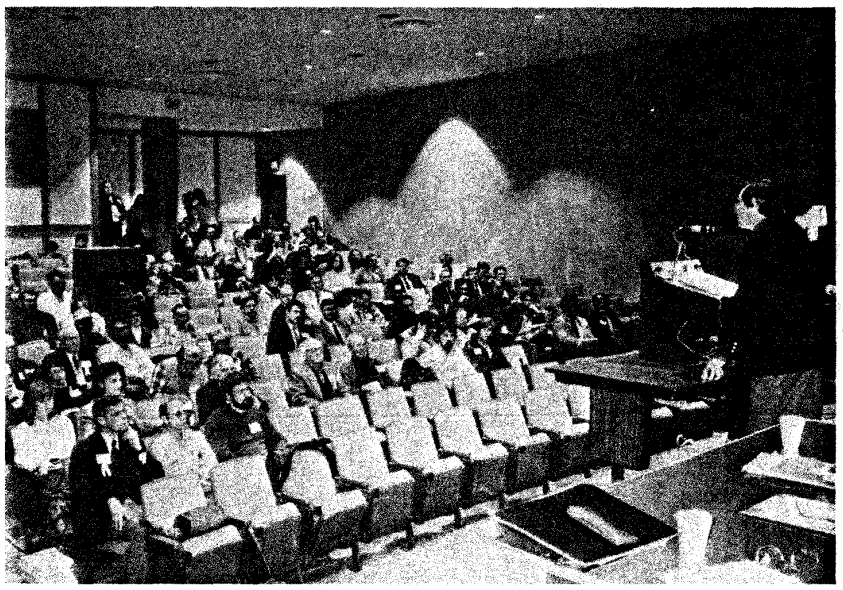
In December 1988 the Groundwater Protection Steering Committee held their third conference at Birdwood to evaluate groundwater protection progress and to invite views on next steps. Participants included representatives from industry, utilities, environmental groups, educational institutions, federal and state agencies, local governments and professionals in the field. Areas which stood out most in the discussions are mentioned below.

The interconnection between land use and groundwater caused a lot of concern about land use planning and whether local governments had 1) sufficient state enabling authority; 2) useable data, or access to expertise to use that data; and 3) implementation funds as localities increasingly became involved in groundwater resource management.

Complete coverage of the state with DRASTIC mapping was a goal expressed by many, but others questioned whether the maps would be used effectively. Other land use issues were reexamination of septic systems, drainfields and septage management regulations especially responsibility for monitoring.

The surface/groundwater relationship was seen by many as a crucial part of this hydrologic cycle. They felt more effort was needed to manage these conjunctively as one water resource in a comprehensive state water management scheme.

Regional or interjurisdictional solutions were looked to in solid waste management and toxic and hazardous material disposal. Waste reduction, minimization, and recycling were



Birdwood Conference (cont)

minimization, and recycling were considered important components of any solution. Attendees saw encouragement of regional solutions as one way of dealing with the financial and technical issues efficiently.

Adequate funding was seen as a key issue in all areas. Suggestions included the General Assembly appropriating enough money to be able to implement groundwater protection standards and regulations at all levels, particularly for underground storage tank regulation and cleanup, retrofitting wells, and low-income assistance for well construction.

For more information, contact Fred Cunningham, Virginia Water Control Board, P. O. Box 11143, Richmond, VA 23230 or 804/367-0411.

Virginia Water Resources Research Center Publications

The Virginia Water Resources Research Center produces research publications and educational materials, and conducts research forums, training programs and conferences. Some of the groundwater related publications which they have available include:

Threats to Virginia's Groundwater by Diana L. Weigmann and Carolyn J. Kroehler (48 page full color book), 1989.
Threats to Virginia's Groundwater by Carolyn J. Kroehler (15 minute slide-tape show or video copy), 1989.
Virginia's Groundwater: You Can Help Protect It (eight page booklet, prepared for the U.S. Environmental Protection Agency, Region III), 1988.
Protecting Virginia's Groundwater: A Handbook for Local Governmental Officials by Margaret Hrezo and Pat Nickinson (44 page book), 1986,
Sandcastle Moats and Petunia Bed Holes by Pat Nickinson (32 page illustrated book for grades 6-8), 1986.
Instructor's Guide to Sandcastle Moats and Petunia Bed Holes by Kathryn P. Sevebeck and Pat Nickinson (a guide for teaching grades 6-8), 1986.
Facts About Virginia's Groundwater (fold-out brochure), 1984, revised 1988.
A Homeowner's Guide to Septic Systems by Torsten D. Sponenberg, Jacob H. Kahn, and Kathryn P. Sevebeck (18 page booklet), 1985.
A Homeowner's Guide to Domestic Wells by Kathryn P. Sevebeck, Jacob H. Kahn, and Torsten D. Sponenberg (26 page booklet), 1985.
Underground Injection Control in Virginia by Carolyn J. Kroehler (10 page booklet), 1989.
Vacant House at Poplar Camp by Elizabeth B. Crumbley (8 page booklet on underground storage tanks), 1986.
Rockbridge's Illegal Dumps by Dennis Slifer (8 page booklet), 1987.
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Bulletin 162: Tillage Effects on Runoff Water Quality from Sludge-Amended Soils by S. Mostaghimi, M. M. Deizman, T. A. Dillaha, C. D. Heatwole, J. V. Perumpral, August 1988.

These materials are available from Publication Services, Virginia Water Resources Research Center, 617 N. Main St., Blacksburg, VA 24060 or 703/961-5624. Single copies are provided free to persons or organizations within Virginia.

Groundwater Management Handbook Published

The *Virginia Groundwater Management Handbook: State Agency Programs for Groundwater Protection* is a guidebook to the multiple groundwater-related programs involved directly and indirectly in groundwater quality. The Handbook is useful to agency officials, permit applicants, and the public as a roadmap of regulatory requirements and procedures. The Handbook includes a matrix correlating potential groundwater contamination sources with the responsible state agencies where permitting programs are involved. Each chapter gives agency and division titles, mailing addresses and telephone numbers. Permitting programs with groundwater quality impacts are identified first within each chapter. Then within each program, agency responsibilities are described and an outline of the overall requirements of the permitting process is provided. Lastly, there is a description of on-going review and compliance steps the agency takes to ensure that initial permit requirements are carried out. For detailed information an individual should still contact the agency involved in administering the program.

For a copy of the Handbook, contact VA Water Control Board, P. O. Box 11143, Richmond, VA 23230 or 804/367-6351.

The goal of groundwater protection planning must be to anticipate and prevent groundwater contaminations.

Water quality preservation is everyone's concern. If you suspect a pollution incident has occurred, please call:

VA WATER CONTROL BOARD
POLLUTION RESPONSE
PROGRAM

for pollution incidents involving surface and groundwater contamination
24-hour hotline
1-804-367-0080

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DEPT. OF EMERGENCY SERVICES

for spills involving hazardous materials
24-hour hotline
1-804-674-2400

Groundwater Protection Steering Committee
Virginia Water Control Board
P. O. Box 11143
2111 North Hamilton Street
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